

Storm_types

Manish Gyawali

December 3, 2018

```
##ENTERING THE DATA
```

```
setwd("E:/Coursera/Reproducible_Research/Final_Assignment/Storm1")
storm_data <- read.csv("repdata%2Fdata%2FStormData.csv", sep = ",")
```

```
##
```

```
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
```

```
##
```

```
##      filter, lag
```

```
## The following objects are masked from 'package:base':
```

```
##
```

```
##      intersect, setdiff, setequal, union
```

```
##
```

```
## Attaching package: 'lubridate'
```

```
## The following object is masked from 'package:base':
```

```
##
```

```
##      date
```

```
storm_physical <- select(storm_data, STATE, EVTYPE, FATALITIES, INJURIES) #Fatalities and Injuries
storm_econ <- storm_data %>% select(STATE, EVTYPE, PROPDMG, PROPDMGEXP, CROPDMG, CROPDMGEXP) #Economic Vari
storm_date_physical <- storm_data %>% select(STATE, EVTYPE, BGN_DATE, END_DATE, FATALITIES, INJURIES)
storm_date_eco <- storm_data %>% select(STATE, EVTYPE, BGN_DATE, END_DATE, PROPDMG, CROPDMG)
```

```
#Grouping on basis of physical data
```

```
by_state_physical <- group_by(storm_physical, STATE)
```

```
by_event_physical <- group_by(storm_physical, EVTYPE)
```

```
#Grouping on basis of economic data
```

```
by_state_eco <- group_by(storm_econ, STATE)
```

```
by_event_eco <- group_by(storm_econ, EVTYPE)
```

```
## Physical
```

```
summarize_event_physical <- summarize_at(by_event_physical, c("FATALITIES", "INJURIES"), sum)
```

```
ordered_fatalities_event <- summarize_event_physical[order((summarize_event_physical$FATALITIES), decreasing=TRUE), ]
```

```
ordered_injuries_event <- summarize_event_physical[order((summarize_event_physical$INJURIES), decreasing=TRUE), ]
```

```
top_events <- head(ordered_fatalities_event, n=10)[,1]
```

```
top_events <- top_events[[1]]
```

```

summarize_state_physical <- summarize_at(by_state_physical, c("FATALITIES", "INJURIES"), sum)
ordered_fatalities_state <- summarize_state_physical[order((summarize_state_physical$FATALITIES), decreasing)]
ordered_injuries_state <- summarize_state_physical[order((summarize_state_physical$INJURIES), decreasing)]

by_state_event <- group_by(by_state_physical, STATE, EVTYPE)
summarize_state_event <- summarize_at(by_state_event, c("FATALITIES", "INJURIES"), sum)
ordered_fatalities_state_event <- summarize_state_event[order((summarize_state_event$FATALITIES), decreasing)]

by_event_state <- group_by(by_state_physical, EVTYPE, STATE)
summarize_event_state <- summarize_at(by_event_state, c("FATALITIES", "INJURIES"), sum)
ordered_fatalities_event_state <- summarize_event_state[order((summarize_event_state$FATALITIES), decreasing)]
ordered_injuries_event_state <- summarize_event_state[order((summarize_event_state$INJURIES), decreasing)]

## Physical
summarize_by_state_propdmg <- summarize_at(by_state_eco, c("PROPDMG"), sum)
ordered_state_propdmg <- summarize_by_state_propdmg[order((summarize_by_state_propdmg$PROPDMG), decreasing)]

summarize_by_state_cropdmg <- summarize_at(by_state_eco, c("CROPDMG"), sum)
ordered_state_cropdmg <- summarize_by_state_cropdmg[order((summarize_by_state_cropdmg$CROPDMG), decreasing)]

summarize_by_event_propdmg <- summarize_at(by_event_eco, c("PROPDMG"), sum)
ordered_event_propdmg <- summarize_by_event_propdmg[order((summarize_by_event_propdmg$PROPDMG), decreasing)]

summarize_by_event_cropdmg <- summarize_at(by_event_eco, c("CROPDMG"), sum)
ordered_event_cropdmg <- summarize_by_event_cropdmg[order((summarize_by_event_cropdmg$CROPDMG), decreasing)]

summarize_event_eco_damage <- bind_cols(summarize_by_event_cropdmg[-c(1)], summarize_by_event_propdmg)
summarize_event_eco_damage %>% mutate(TOTALDMG = PROPDMG + CROPDMG) %>% as.data.frame() %>% head(n=10)

```

```

##      CROPDMG      EVTYPE PROPDMG TOTALDMG
## 1      0      HIGH SURF ADVISORY      200      200
## 2      0      COASTAL FLOOD      0      0
## 3      0      FLASH FLOOD      50      50
## 4      0      LIGHTNING      0      0
## 5      0      TSTM WIND      108      108
## 6      0      TSTM WIND (G45)      8      8
## 7      0      WATERSPOUT      0      0
## 8      0      WIND      0      0
## 9      0      ?      5      5
## 10     0      ABNORMAL WARMTH      0      0

```

```

summarize_state_damage <- bind_cols(summarize_by_state_propdmg, summarize_by_state_cropdmg[,2])
summarize_state_damage %>% mutate(TOTALDMG = PROPDMG + CROPDMG)

```

```

## # A tibble: 72 x 4
##   STATE PROPDMG CROPDMG TOTALDMG
##   <fct>   <dbl>   <dbl>   <dbl>
## 1 AK      33996.    205    34201.
## 2 AL      363607.  9667.  373274.
## 3 AM       5654.    50    5704.
## 4 AN        294     0     294
## 5 AR      361122. 25819. 386941.

```

```
## 6 AS      2954.   1564    4518.
## 7 AZ      83047.  1374    84421.
## 8 CA     203599. 21152.  224751.
## 9 CO      81497.  9290.   90787.
## 10 CT     29155.    30    29185.
## # ... with 62 more rows
```

```
cor(summarize_state_damage[,2], summarize_state_damage[,3])
```

```
##          CROPDMG
## PROPDMG 0.5919995
```

```
top_events_eco <- bind_cols(ordered_event_propdmg, ordered_event_cropdmg)
state_all_eco <- bind_cols(summarize_state_physical, summarize_state_damage)[-c(2,3,4)]
```

```
by_event_state_eco <- group_by(by_state_eco, EVTYPE, STATE)[-c(4,6)]
summarize_event_state_eco <- summarize_at(by_event_state_eco, c("CROPDMG", "PROPDMG"), sum)
ordered_prop_event_state_eco <- summarize_event_state_eco[order((summarize_event_state_eco$PROPDMG), decreasing = TRUE),]
ordered_crop_event_state_eco <- summarize_event_state_eco[order((summarize_event_state_eco$CROPDMG), decreasing = TRUE),]
```

```
state_eco_ranked_propdmg <- state_all_eco[order((state_all_eco$PROPDMG), decreasing = TRUE),]
```

```
uni_top_events <- data.frame()
for (i in 1:10) {
  uni_top_events <- bind_rows(uni_top_events, filter(by_state_physical, EVTYPE == top_events[i]))
}
```

```
uni_top_events_by_state <- group_by(uni_top_events, STATE)
uni_top_events_by_event <- group_by(uni_top_events, EVTYPE)
```

```
summarize_at(uni_top_events_by_state, vars(FATALITIES), sum)
```

```
## # A tibble: 55 x 2
##   STATE FATALITIES
##   <fct>      <dbl>
## 1 AK          37
## 2 AL         738
## 3 AR         503
## 4 AS          9
## 5 AZ         156
## 6 CA         236
## 7 CO         124
## 8 CT          24
## 9 DC          24
## 10 DE         17
## # ... with 45 more rows
```

```
summarize_at(uni_top_events_by_event, vars(FATALITIES), sum)
```

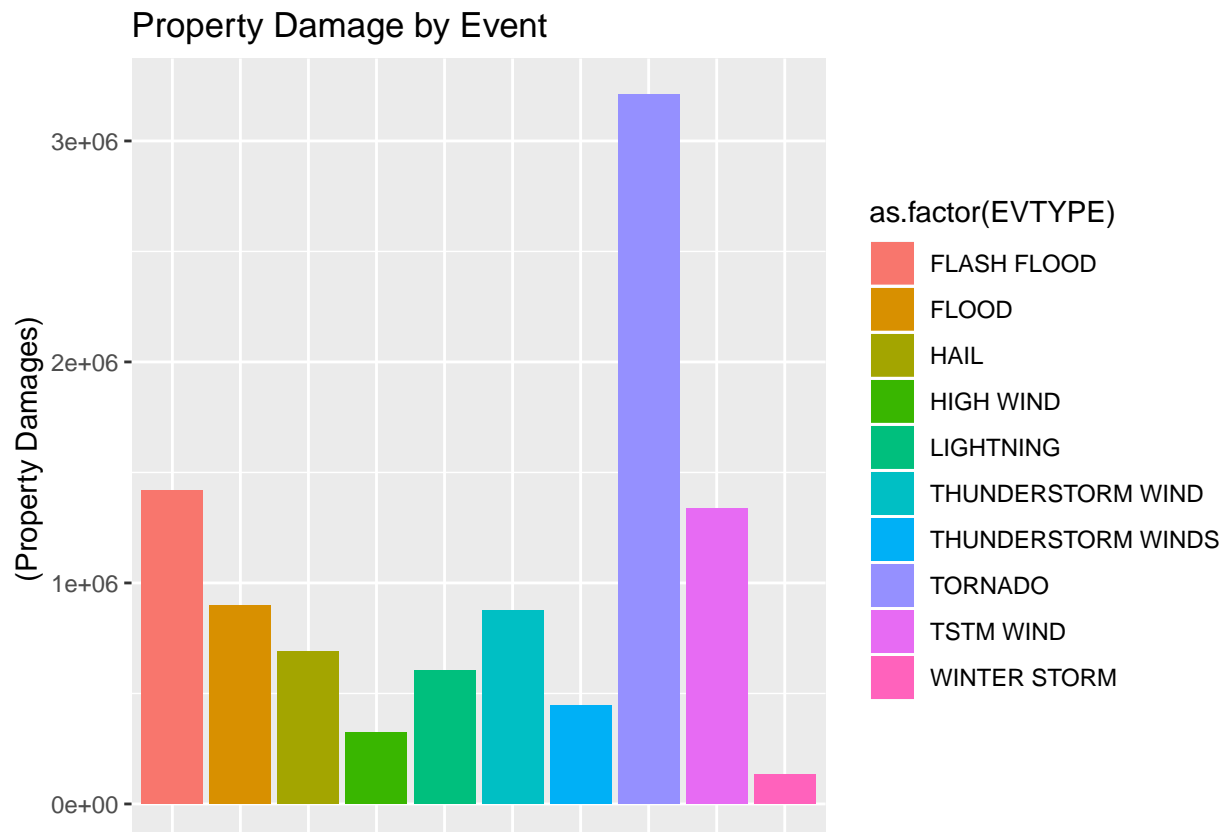
```
## # A tibble: 10 x 2
##   EVTYPE      FATALITIES
```

```
##      <fct>                <dbl>
## 1 AVALANCHE                224
## 2 EXCESSIVE HEAT          1903
## 3 FLASH FLOOD             978
## 4 FLOOD                   470
## 5 HEAT                    937
## 6 HIGH WIND               248
## 7 LIGHTNING               816
## 8 RIP CURRENT             368
## 9 TORNADO                 5633
## 10 TSTM WIND              504
```

```
top_events_eco <- as.data.frame(top_events_eco)
```

```
#Barchart of Property Damage
```

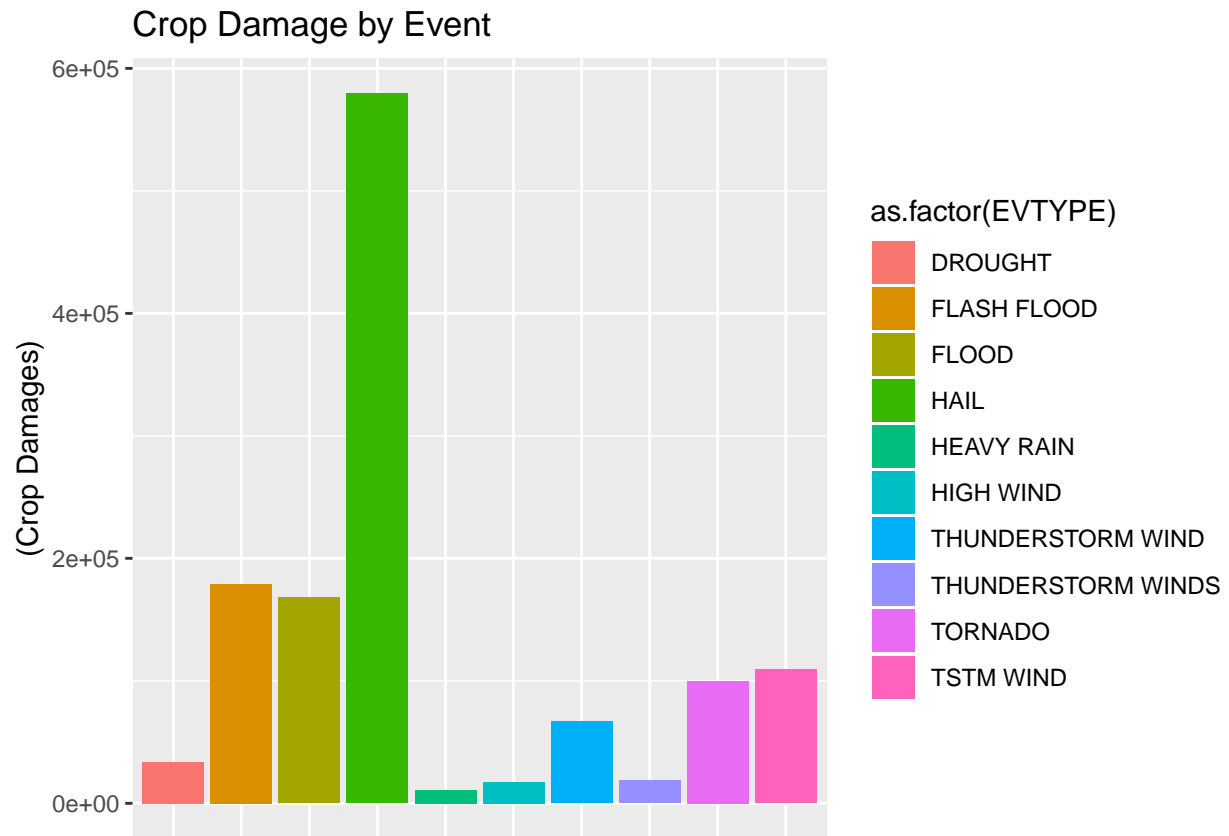
```
g = ggplot(head(ordered_event_propdmg, n=10), aes(x = factor(EVTYPE),
  y = (PROPDMG), fill = as.factor(EVTYPE)))
g + geom_bar(stat = "identity") + labs(x = "Event", y = "(Property Damages)") +
  ggtitle("Property Damage by Event") + theme(axis.title.x=element_blank(),
    axis.text.x=element_blank(),
    axis.ticks.x=element_blank())
```



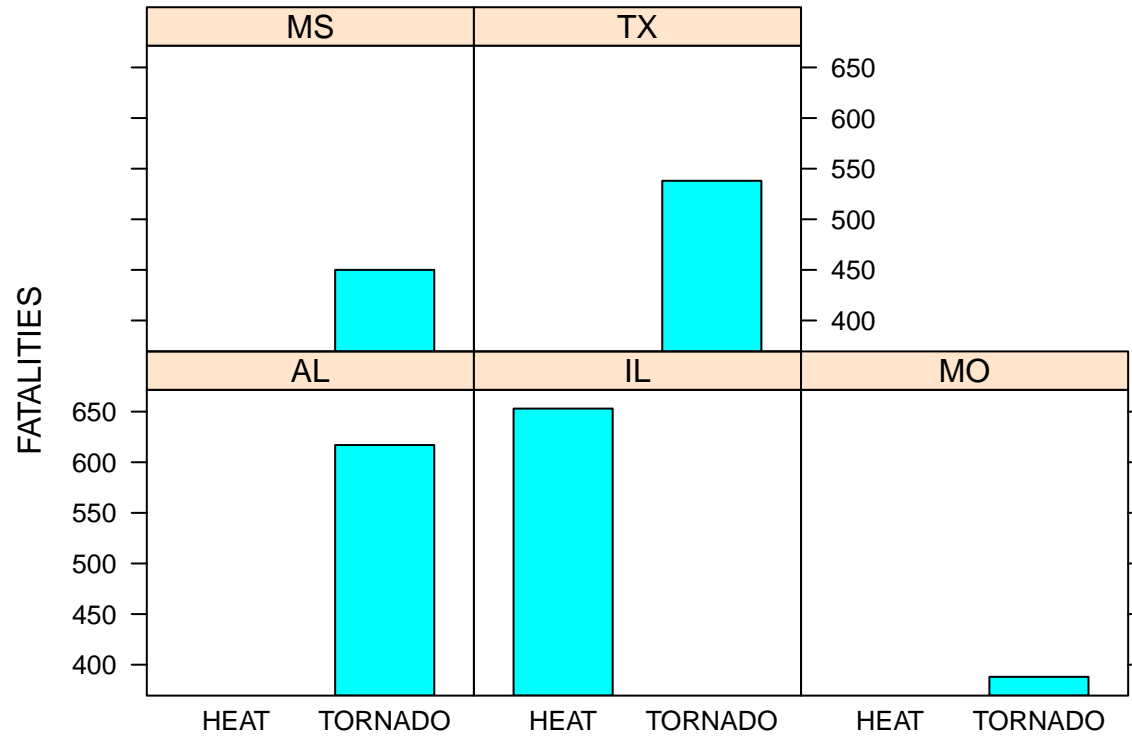
```
#Barchart of Crop Damage
```

```
g = ggplot(head(ordered_event_cropdmg, n=10), aes(x = factor(EVTYPE),
  y = (CROPDMG), fill = as.factor(EVTYPE)))
```

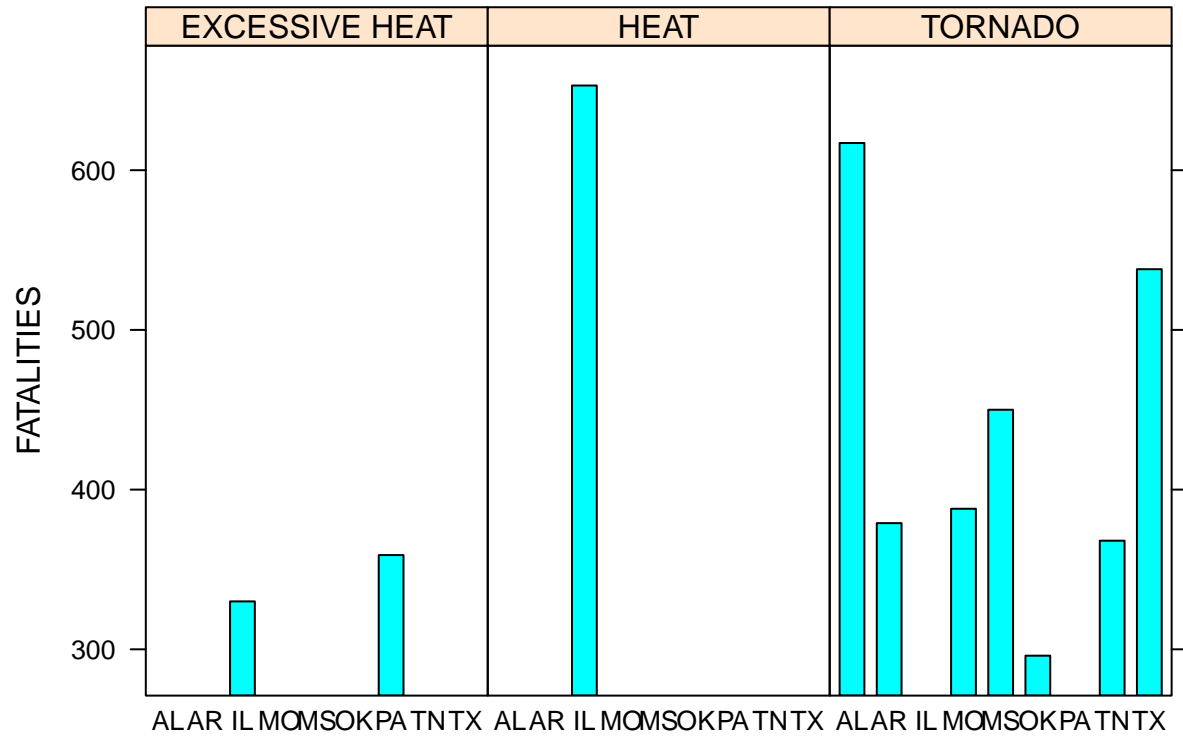
```
g + geom_bar(stat = "identity") + labs(x = "Event", y = "(Crop Damages)") +
  ggtitle("Crop Damage by Event") + theme(axis.title.x=element_blank(),
    axis.text.x=element_blank(),
    axis.ticks.x=element_blank())
```



```
barchart(FATALITIES ~ EVTYPE | factor(STATE), data = head(ordered_fatalities_state_event, n = 5))
```



```
barchart(FATALITIES ~ STATE | factor(EVTYPE), data = head(ordered_fatalities_event_state, n = 10))
```



```
plot(summarize_state_damage$PROPDGM, summarize_state_damage$CROPDGM, type = "p", xlab = "Summary of Property
Damage by State", ylab = "Summary of Crop Damage by State")
```

